

**United States Department of the Interior  
Bureau of Land Management  
Pecos District, Carlsbad Field Office**

**DOI-BLM-NM-P020-2013-324-EA  
Delaware River Native Aquatic Species Reestablishment Program**

## **CHAPTER 1. INTRODUCTION**

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### **1.1. Purpose and Need for Action**

Restoration of native species is a goal of the Bureau of Land Management (BLM). To that end, the Restore New Mexico program has been developed. In this program, habitat improvement and subsequent reintroductions of native species is being carried out. Native species are an integral part of ecosystem function and thus are necessary and needed components. The reestablishment of native populations can also decrease the possibility of further up-listings at the state and federal levels. As stated in the Special Status Species Management Policy 6840 (6840 Policy) (Rel. 6-125), it is BLM policy "to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of and need for listing of these species under the Endangered Species Act (ESA).

The Black River (Eddy County) supports the only identified population of Texas hornshell (*Popenaias popeii*) in New Mexico. Currently, the species inhabits approximately 12% of its historic range in New Mexico, where the population is limited to an 8.7 mile stretch of the Black River. The land area around the Black River is experiencing a high level of oil and gas development and current forecasts are predicting a further increase in oil and gas activities. These activities may increase the potential of further impacts to the Black River's watershed. The land area surrounding the occupied habitat is of varied ownership, which results in differentiating land management prescriptions. Also, within occupied habitat, there are several heavily used river crossings. These crossings have the potential for contributing to catastrophic accidents due to commercial transport of chemical products (e.g., produced brine water, raw and refined petroleum products, and toxic chemicals) across the Black River. As a result an accidental spill of contaminants would pollute surface waters of the river and threaten extant populations of the Texas hornshell. Therefore we would like to establish a second population in the Delaware River. There is a significant potential for a successful reintroduction of the Texas hornshell to the historic range of the Delaware River. The Texas hornshell is a Federal candidate species for listing under the Endangered Species Act (ESA) with a current listing priority of 8. The proposed action, if successful, would contribute to an increase in the number of populations and further protect the species' from decline in New Mexico. The stocking of Texas hornshell could also decrease the need to federally list the species.

The gray redhorse (*Moxostoma congestum*) historically occurred in the Rio Grande River, but is now found only in the lower Pecos and Black Rivers. The gray redhorse is listed as endangered by the state of New Mexico. It is also recorded in the NMDGF Comprehensive Wildlife Conservation Strategy (CWCS) as a species of greatest conservation need and is a BLM special status species.

The need for the proposed action is to reestablish native aquatic species to the Delaware River, NM.

## 1.2. Conformance with Applicable Land Use Plan(s)

The 1988 Carlsbad Resource Management Plan, as amended by the 1997 Carlsbad Approved Resource Management Plan Amendment have been reviewed, and it has been determined that the proposed action conforms with the land use plan terms and conditions as required by 43 CFR 1610.5. The proposed action is in compliance with the policies established by Manual 6840, the Special Status Species Management Manual for the BLM

## 1.3. Scoping, Public Involvement, and Issues

The Carlsbad Field Office (CFO) publishes a NEPA log for public inspection. This log contains a list of proposed and approved actions in the field office. The log is located in the lobby of the CFO as well as on the BLM New Mexico website ([http://www.blm.gov/nm/st/en/prog/planning/nepa\\_logs.html](http://www.blm.gov/nm/st/en/prog/planning/nepa_logs.html)).

The CFO uses Geographic Information Systems (GIS) in order to identify resources that may be affected by the proposed action. A map of the project area is prepared to display the resources in the area and to identify potential issues.

The proposed action was circulated among CFO resource specialists in order to identify any issues associated with the project. The issues that were raised include:

- How will range management be impacted by the proposed action?
- How will soils be impacted by the proposed action?
- How will vegetation be impacted by the proposed action?
- How will wildlife be impacted by the proposed action?
- How will the Delaware riparian area be impacted by the proposed action?
- How will water quality/quantity be impacted by the proposed action?
- How will special status species be impacted by the proposed action?
- How will recreation be impacted by the proposed action?
- How will cultural resources be impacted by the proposed action?

# CHAPTER 2. PROPOSED ACTION AND ALTERNATIVE(S)

## 2.1. Proposed Action

### Reestablishment of Native Aquatic Species

#### Stocking of captive held gray redhorse (*Moxostoma congestum*)

The New Mexico Department of Game and Fish (NMDGF) has proposed to release approximately 100-200 sub-adult (age 3) gray redhorse, into the Delaware River, New Mexico (Appendix I) in conjunction with the BLM, Carlsbad Field Office, Fisheries program. The fish would be stocked at several points along the river that are accessible by NMDGF stocking truck. The "lower dam site", the "pipeline crossing" and below the highway 285 bridge are three of the possible release sites. Fish would be transported in a hatchery truck and arrive at the river prepared for release in May/June 2013. The truck would back down to the rivers edge and through a pipe or hatch, the fish would be acclimated to salinity and temperature, then placed directly into the river. Subsequent releases may occur on an annual basis as fish become available. The fish are currently being held at the Albuquerque Biological Park, an accredited member of the American Zoo and Aquarium Association, and satisfactoriness of fish health has been completed by Dexter National Fish Laboratory. Fish health testing indicates that the facility is free of common fish diseases, such as ich (*Ichthyophthirius multifiliis*), Asian tapeworm, and whirling disease, and a subsample (10%) of the fish would be fin-clipped for future genetic reference.

Monitoring would occur each annually through 2017 to verify presence and condition of gray redhorse in the Delaware River. Techniques would include trammel nets and seines and would be completed jointly by NMDGF and BLM as possible.

#### **Stocking of wild gray redhorse (*Moxostoma congestum*)**

To provide genetic and age-class diversity, NMDGF would collect and transport supplemental stocks of gray redhorse from the Black River. Gray redhorse would be collected and transferred in September, well after the breeding season for Texas hornshell, to prevent any unintentional movement of Texas hornshell glochidia. Approximately 20-50 gray redhorse of a variety of size classes, as available, would be moved each September through 2015.

Monitoring would occur each September through 2017 to verify presence and condition of gray redhorse in the Delaware River. Techniques would include trammel nets and seines and would be completed jointly by NMDGF and BLM as possible.

#### **Reintroduction of Texas hornshell (*Popenaias poeii*)**

In 2013 and 2014, NMDGF and BLM would complete research necessary for the restoration of Texas hornshell in the Delaware River. This would include, but not be limited to, collection of additional water chemistry information, designation of potential stocking sites, and development of techniques which have proven successful for mussel transplants elsewhere. As a preliminary test, NMDGF would move 20-30 adult Texas hornshell in equal sex ratios from the Black River to appropriate sites in the Delaware River in May 2013 (Appendix II). All mussels would be marked with Floy tags and specific location information (GPS coordinates) would be recorded.

In May 2014, survival of the original stock of Texas hornshell placed in the Delaware River would be assessed by NMDGF. Depending on the success of the preliminary transfer, additional stocking efforts would be conducted through at least 2018. Potential methods for restoration of Texas hornshell include, but are not limited to, movement of adult mussels, stocking of juvenile mussels reared in captivity, and transfer of host fish infested with glochidia.

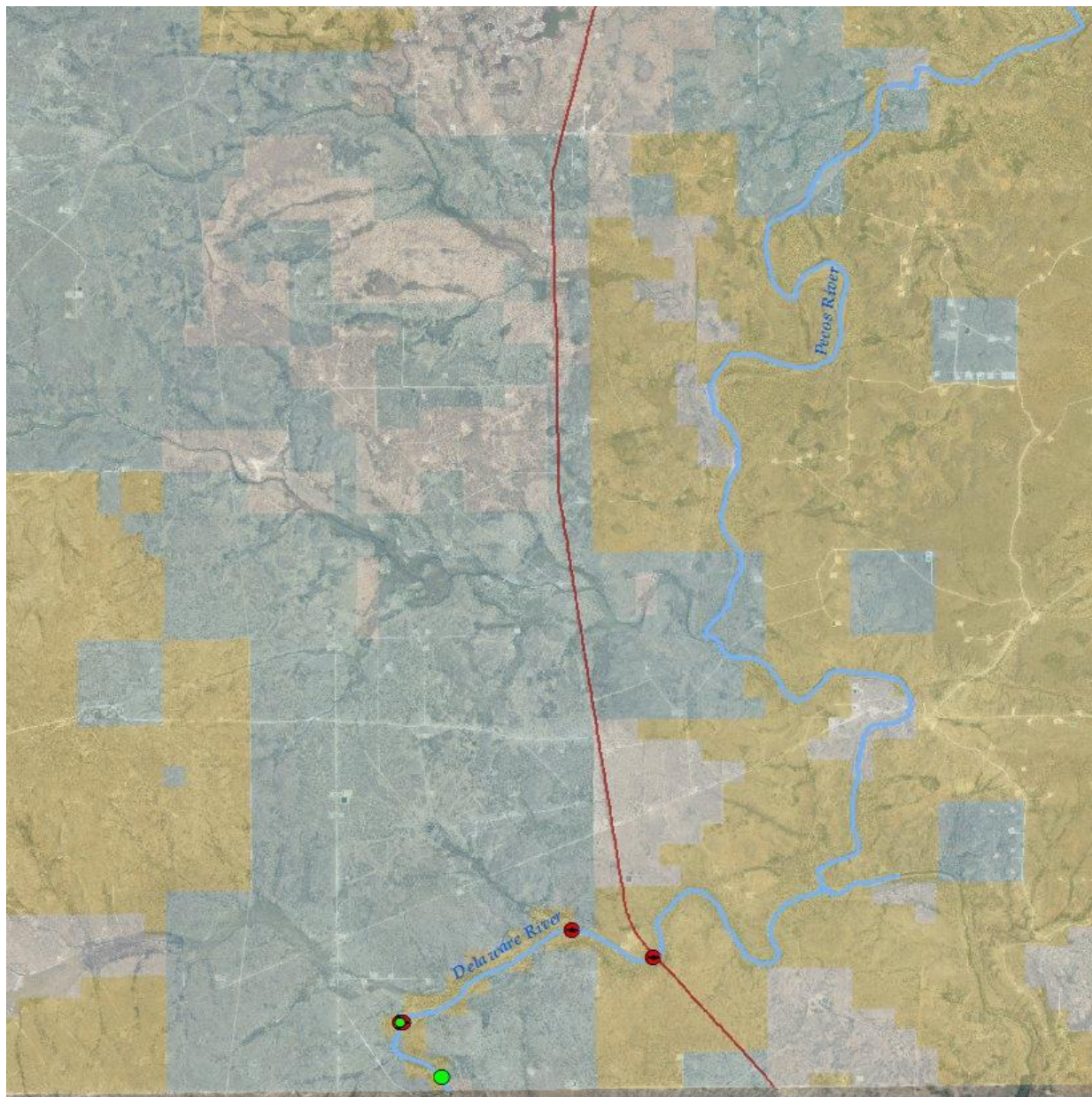
Beginning in May 2014 and continuing each year thereafter, monitoring of Texas hornshell in the Delaware would be jointly conducted by NMDGF and BLM. Methods would follow those employed for Texas hornshell in the Black River and would include snorkeling searches of habitat and collection of mussel condition data.

#### **Location:**

The locations will be the BLM portion of the Delaware River from the Texas state line, downstream to the confluence with the Pecos River; Eddy County, NM. (Approximately nine miles of stream).

## **2.2. No Action**

The BLM NEPA Handbook (H-1790-1) states that for Environmental Assessments (EAs) on externally initiated proposed actions, the No Action Alternative generally means that the proposed activity will not take place. This option is provided in 43 CFR 3162.3-1 (h) (2). Gray redhorse and Texas hornshell mussel would not be stocked, and reestablishment of native gray redhorse or Texas hornshell mussel would not occur.



## Aquatic Species Reintroduction Appendix 1



Gray Redhorse



TX Hornshell



Rivers



NM Townships



Bureau of Land Management



Bureau of Reclamation



Private



State

0 0.5 1 2 Miles

1:94,992



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Map created 8/22/2012







## **2.3. Alternatives Considered but Eliminated from Detailed Analysis**

The Pecos River was considered for a possible reintroduction site, but due to the high salinity level the probability of a successful reintroduction of the Texas hornshell would be minimal. Therefore, this action will not be analyzed.

## **CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

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Under the No Action Alternative, the proposed project would not be implemented and there would be no new impacts to natural or cultural resources from the proposed action. The No Action Alternative would result in the continuation of the current land and resource uses in the project area and is used as the baseline for comparison of environmental effects of the analyzed alternatives.

During the analysis process, the interdisciplinary team considered several resources and supplemental authorities. The interdisciplinary team determined that the resources discussed below maybe affected by the proposed action.

### **3.3. Range**

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#### ***3.3.1. Proposed Action***

The proposed action is within the Lower Delaware River (#78141) and Delaware River West (#78142) grazing allotments. These allotments are run as cow-calf deferred rotation operation. Range improvement projects such as windmills, water delivery systems (pipelines, storage tanks, and water troughs), earthen reservoirs, fences, and brush control projects are located within the allotment. In general, an average rating of the range land within this area is six acres/AUM (Animal Unit Months). In order to support one cow, for one year, about 72 acres is needed. This equals about nine cows per section.

The Lower Delaware River allotment now has fencing north and south of the river and the “riparian” pasture created by these fences is scheduled to be grazed from November 15th to March 14th of each year. The Delaware River West allotment has a fence north of the river and cattle have access to the river pasture from November to March. Both allotments have growing season rest for the riparian pastures.

Off-site waterings, using solar pumps to move water from the river to upland sites, have been placed in five locations. Two are on the Lower Delaware River allotment and three are on the Delaware River West grazing allotment. These waters were designed to provide water sources away from the river, to keep livestock on the upland sites, thus providing additional protection to the riparian zone.

#### **Direct and Indirect Effects**

No effect would occur on range allotments from the stocking of the gray redbone and/or the possible inclusion of the Texas hornshell. Current stipulations outlined in the grazing permits (e.g. growing season exclusion) would not change due to the proposed action. Water gaps, riparian enclosure fences and off-channel water tanks would still be able to be constructed after stocking has occurred.

### **3.4. Soils**

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#### ***3.4.1. Proposed Action***

Soils at the proposed sites formed in stratified alluvium and occur on the floodplain and adjacent to the stream. The soils are typically deep with textures ranging from loamy fine sands to fine sandy loams.

There are five soil mapping units within the project area. These are the Pajarito-Dune land complex (PD), Reagan loam (RA), Reeves-Gypsum land complex (RG), Upton gravelly loam (UG), and Russler-Ector association (RU). The majority of the area is mapped as Pajarito-Dune land complex (PD), which is a sandy soil. The Reagan loam (RA) makes up the next largest portion, while the Reeves-Gypsum land complex (RG), is the third largest mapping unit. The other two make up very little of the overall area.

### **Sandy**

Typically, these soils are deep, well-drained to excessively drained, non-calcareous to weakly calcareous sands. They are found on undulating plains and low hills in the “sand country” east of the Pecos River. Permeability is moderate to very rapid, water-holding capacity is low to moderate, and little runoff occurs. These soils are susceptible to wind erosion and careful management is needed to maintain a cover of desirable forage plants and to control erosion. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and high temperatures.

Low stability soils, such as the sandy and deep sands found on this area, typically contain only large filamentous cyanobacteria. Cyanobacteria, while present in some locations, are not significant. While they occur in the top 4 mm of the soil, this type of soil crust is important in binding loose soil particles together to stabilize the soil surface and reduce erosion. The cyanobacteria also function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. Cyanobacteria are mobile, and can often move up through disturbed sediments to reach light levels necessary for photosynthesis. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

### **Loamy**

Generally these soils are deep, well-drained, moderately dark colored, calcareous, and loamy. These soils typically occur on gently undulating plains and in the broader valleys of the hills and mountains. Permeability is moderate, water-holding capacity is moderate to high, and runoff is likely after prolonged or heavy rains. Careful management is needed to maintain a cover of desirable forage plants and to control erosion. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and high temperatures.

These soils generally have cyanobacteria throughout the area, while squamulose, crustose, and gelatinous lichens are occasionally present. These soil crusts are important in binding loose soil particles together to stabilize the soil surface and reduce erosion. Biological soil crusts can contribute positively to soil stability, fixing atmospheric nitrogen, nutrient contributions to plants, water infiltration, and plant growth. They function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. In addition, they can act as living mulch which discourages the establishment of annual/invasive weeds. Structurally they form an uneven, rough carpet that reduces raindrop impact and slows surface runoff. Below the surface, lichen and moss rhizines, fungal hyphae, and cyanobacterial filaments all act to bind the soil surface particles just below and at the surface. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

### **Gypsum**

These soils have a loamy surface layer, with gypsiferous materials starting at a depth of 1 to 10 inches. They are found on gently undulating uplands, with steep, broken gypsum outcrops occurring in places. Permeability varies from very low to moderate, water-holding capacity is very low to low, and runoff rapid to very rapid. Soil fertility and the rooting zone are limited by the underlying gypsiferous material. These soils are subject to severe erosion once the vegetative cover is lost. Reestablishing native plant cover could take 3-5 years due to unpredictable rainfall and high temperatures.

These areas have good populations of squamulose lichens, a few crustose and gelatinous lichens, and cyanobacterial, which is present throughout the top 2 mm of the soil. These soil crusts are important in binding loose soil particles together to stabilize the soil surface and reduce erosion. They also function in the nutrient cycle by fixing atmospheric nitrogen, contributing to soil organic matter, and maintaining soil moisture. In addition, they can act as a living mulch which discourages the establishment of annual/invasive weeds. Structurally they form an uneven, rough carpet that reduces rain drop impact and slows surface runoff. Below the surface, lichen and moss rhizines, fungal hyphae, and cyanobacterial filaments all act to bind the soil surface particles just below and at the surface. Horizontally, they occur in nutrient-poor areas between plant clumps. Because they lack a waxy epidermis, they tend to leak nutrients into the surrounding soil. Vascular plants such as grasses and forbs can then utilize these nutrients.

### **Direct and Indirect Effects**

A minimal amount of soil and vegetation would be disturbed during stocking activities through the movement of the stocking truck.

## **3.5. Vegetation**

### **3.5.1. Proposed Action**

The flood plain and riparian zone vegetation consists of various species of willow (*Salix*), false willow (*Baccharis*), sparse, mature and sapling cottonwood trees, walnut and desert willow. Various grasses occur in the riparian zone such as tobosa and Bermuda. Sedges and rushes also occur along the river. Upland sites on these allotments, which form the contributing watershed to the Delaware River, have recently been treated with Tebuthion to control brush encroachment. The grass cover replacing the brush is expected to reduce runoff, increase infiltration, and lower sediment yield to the river.

### **Direct and Indirect Effects**

A minimal amount of soil and vegetation would be disturbed during stocking activities through the movement of the stocking truck.

## **3.6. Fish & Wildlife**

### **3.6.1. Proposed Action**

This project occurs in the Chihuahuan Desert habitat type. The Chihuahuan desert is one of the four most biologically rich and diverse desert ecoregions in North America. Numerous plant species live in this desert. The Chihuahuan Desert stretches from the southeastern corner of Arizona across southern New Mexico and west Texas to the Edwards Plateau in the United States. It runs deep into central Mexico, including parts of the states of Chihuahua, northwest Coahuila, northeast Durango and several others. This is bounded by the Sierra Madre Occidental to the west and the Sierra Madre Oriental to the east, extending as far south as San Luis Potosi and to the isolated islands of the Chihuahuan vegetation in the Mexico states of Queretaro and Hidalgo. In New Mexico, Chaves and Eddy Counties, west of the Pecos River, consist largely or entirely of Chihuahuan Desert habitat type. The dominant plant species throughout the Chihuahuan desert is creosote bush. Depending on diverse factors such as type of soil, altitude, and degree of slope, creosote bush can be found in association with other woody and grass species.

The Chihuahuan desert supports a large number of wide-ranging mammals, herpetofauna, and avian species. Mammals include but are not limited to: pronghorn antelope, mule deer, grey fox, collared peccary, bobcat, desert cottontail, blacktail jack rabbit, kangaroo rat, pocket mice, woodrats and deer mice. Herpetofauna include but are not limited to: Texas horned lizard, greater earless lizard, several species of spiny and whip tail lizards, and several species of venomous and non-venomous snakes.



### **Gray Redhorse (*Moxostoma congestum*)**

The gray redhorse (*Moxostoma congestum*) is a relatively large sucker in the family Catostomidae that may attain lengths of 500mm or more. In New Mexico it historically has been found in the Lower Pecos and Lower Rio Grande Rivers as well as tributaries to those rivers (i.e. Black River, Carlsbad Lake, etc.). However, it no longer is found in the Rio Grande River. The adult gray redhorse inhabits slow velocity, sluggish streams, and relatively deep pools over several substrates (i.e. rocky, gravelly, silt and sand). Juveniles mainly inhabit riffle habitat, possibly for protection from piscivorous fishes.

They spawn in the springtime, over gravelly/cobbled tail waters of pools at the upper end of riffles. The redhorse is omnivorous but mainly feeds on benthic invertebrates and sometimes on vegetation. They feed in riffles as well as pools. The fish cohabitates with multiple species of fishes including longnose gar, blue sucker, smallmouth buffalo, and channel catfish. Although the species remains common throughout its range in Texas, it's rare in New Mexico (Propst 1999). The gray redhorse was listed as State of New Mexico endangered in 1976, and is on the NM state list of Species of greatest conservation need. However, no federal listing is likely to occur given its persistence elsewhere in its range (i.e. Texas and Mexico) (Sublette et al. 1990).

Historical efforts to remove non-game (i.e. rough) fish from the redhorse's range, especially in the lower Pecos, have contributed to the decline of the species in addition to the introduction of exotic species that use similar habitats (e.g. grass carp). Diminishing surface water is also a culprit in its decline (Propst 1999).

### **Texas hornshell mussel (*Popenaias poeii*)**

The Texas hornshell mussel historically occurred in the Pecos River system from the North Spring River, near Roswell, Chaves County, New Mexico (Cockerell 1902), throughout the Pecos River and in the lower Rio Grande to Brownsville, Cameron County, Texas (Neck and Metcalf 1988). In 1992, Texas Parks and Wildlife Department (TPWD) personnel found shells of Texas hornshell between Big Bend and the mouth of the Pecos River (Howells and Ansley 1999, Strenth et al.2004). Currently, the species inhabits approximately 12% of its historic range in New Mexico, where the population is limited to an 8.7 mile stretch from Black River Village downstream to the Carlsbad Irrigation District (CID) dam, of the Black River in Eddy County (Carman, S.M. 2007). Probable causes of their decline include: habitat modification in the form of impounds, diversions for agriculture and flood control, contamination of water from oil and gas industry, increased deposition of soft silt due to excessive run-off, scouring of stream beds during storm events, increased amounts of aquatic vegetation and the introduction of exotic species. Much of the river habitat within the historic range of Texas hornshell has experienced tremendous increases in salinity as a result of agricultural returns to the rivers. Salinity in particular is thought to limit Texas hornshell distribution (Lang 2001).

The habitat requirements found in the Black River study area consist of crevices under travertine shelves and boulders where soft sediment gathers (Carman, S.M. 2007). This area has the essential water quality and quantity that is a prime element of Texas hornshell habitat. The specific fish species including Blue Sucker, Channel Catfish, Gizzard Shad, Grey Redhorse, Longear Sunfish, Red Shiner and River Carpsucker that are needed in the Texas hornshell life cycle are found within the mentioned stretch of the Black River. On 11 May 2004, USFWS was petitioned to list Texas hornshell on the Candidate list as a Federally Endangered Species.

## **Direct and Indirect Effects**

A minimal and/or temporary displacement of wildlife may occur during stocking activities. Recreational opportunities for fishing may increase due to the stocking. Some trampling of terrestrial wildlife habitat may occur due to increased fishing along the banks. Aquatic habitat may improve by the reestablishment of gray redhorse and the Texas hornshell mussel. As they were a part of the ecosystem historically, their restoration may improve stream habitat quality.

Recent surveys of the Delaware River indicate the presence of the native, headwater catfish. Further laboratory testing has confirmed its presence. Stocking of gray redhorse and possible reestablishment of the Texas hornshell, would not significantly affect headwater catfish. The two fish species utilize different parts of the ecosystem and do not compete for resources such as food. The diet of the gray redhorse consists of small aquatic insects and mollusks where as headwater catfish consumes vegetation such as algae and other detritus.

## **3.7. Delaware Riparian Area**

### ***3.7.1. Proposed Action***

Riparian areas are located adjacent to rivers, creeks, lakes, springs, and wetlands. They are a transition zone between the upland and aquatic ecosystems. The increased moisture found in these areas produces unique plant communities that differ noticeably from surrounding range land. A properly functioning riparian/wetlands system has the ability to perform the following: to purify water by removing sediments and other contaminants, lessen excessive erosion, carbon sequestration, diminish the impact of floods, preserve perennial stream flow, recharge ground water, provide corridors for flora and fauna, provide critical habitat for birds, wildlife, fish and other aquatic organisms and produce abundant, high quality forage for wildlife.

The BLM uses Proper Functioning Condition (PFC), a qualitative method for assessing the condition of riparian areas and wetlands. PFC refers to both the assessment process and the on-the-ground condition of a riparian areas and wetlands. The assessment process consists of an approach that considers the hydrology, vegetation, and erosion/deposition attributes of the area. The on-the-ground condition refers to how well the physical processes are functioning. This condition is a state of resiliency that allows a riparian area or wetland to hold together during high-flow events with a high degree of reliability. This resiliency allows an area to then produce desired values over time, including fish habitat, neotropical bird habitat or forage. Riparian areas and wetlands that are not functioning properly cannot sustain these values. PFC assessments performed between 2003 & 2012 have determined that the Delaware River riparian area is at proper functioning condition.

### **Direct and Indirect Effects**

All actions regarding this project will be associated with preexisting linear disturbances. The project as proposed will have no significant impacts to the riparian area.

## **3.8. Water Quality/Quantity**

### ***3.8.1. Proposed Action***

#### Surface Water:

The surface water within the area is affected by geology, precipitation, and water runoff and erosion. Factors that currently affect surface water resources include livestock grazing activities and oil and gas development.

USGS gage data from the Delaware River NR Red Bluff, NM gage site from January 1 2001 to January 1 2012 shows a low flow at 0.23 cfs and a high flow at 639.0 cfs at flood stage (See Figure 1). The Delaware River is a perennial river with periods of intermittent flows in lower segment of the river.

Surface water quality data for the Delaware River located at Dam Site 1 is available from 2004 to 2007. The water quality data indicates this system can support warm water fish such as the gray redhorse. Water temperature ranged from 67.4 F to 84.6 F for the water quality measurements. Specific Conductance ranged from 1.407 mS/cm to 3.71 mS/cm. pH ranged from 7.46 to 9.63. Total Dissolved Solids ranged from 0.9 g/L to 2.2 g/L. Dissolved oxygen levels ranged from 2.5 mg/L to 4.04 mg/L. Dissolved Oxygen % Sat ranged from 22.8 to 53.3. Discharge ranged from 0.166 cfs to 2.95 cfs at the Dam Site 1 location.

While these data indicate room for improvement, current water quality and quantity should support a released population of gray redbreast.

#### Ground Water:

Groundwater within the area is affected by surface and subsurface geology, topography, precipitation and geomorphogenic processes.

Fresh water sources for irrigation and stock use in the area is obtained from the shallow unconfined Quaternary Alluvium Aquifer and the Rustler Aquifer. The approximate depth to groundwater in the area ranges from 20 feet to 50 feet (BLM Groundwater Table Map 2005).

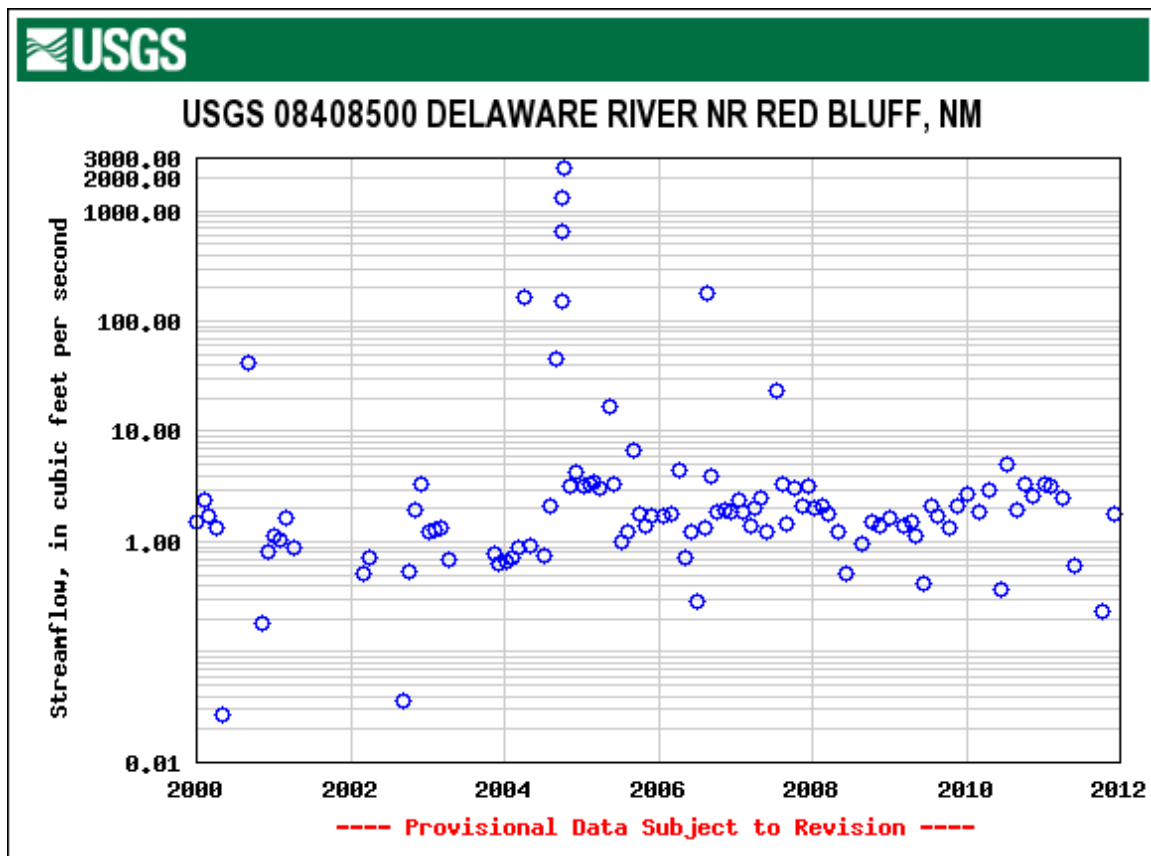


Figure 1: USGS gage data

Surface water quality data collected by the BLM is shown in the table below:

<b>Delaware River Water Quality Data Site 1 Above Dam Table 1</b>				
Date/Time	6-25-2004	4-19-2005	7-22-2005	9-28-2007 18:15 hrs
Water Temp	77.8 F	67.4 F	84.6 F	75.3 F
Specific Cond	1.407 mS/cm	2.76 mS/cm	3.44 mS/cm	3.71 mS/cm
pH	7.46	7.83	8.27	9.63
TDS	0.9 g/L	1.8 g/L	2.2 g/L	2.0 g/L
DO	2.99 mg/L	1.72 mg/L	4.04 mg/L	2.5 mg/L
DO % Sat	43.9	22.8	53.3	25.7
Discharge	0.166 cfs	2.95 cfs	0.283 cfs	Not Performed
Air Temp	91 F	90 F	90 F	85 F

### **Direct and Indirect Effects**

Stocking these species is not expected to have an impact on existing surface water or groundwater quality.

## **3.9. Recreation**

### **3.9.1. Proposed Action**

The area is frequently used by the public interested in fishing, picnicking, bird watching, hiking, horseback riding, ATV use, and feral hog hunting.

Roads on the uplands leading to the river currently exist at the pipeline crossing and the lower dam. River access associated with these two roads have been restricted by the construction of a pipe-rail fence. Access is still permitted for administrative use such as the proposed action.

### **Direct and Indirect Effects**

Stocking these species is not expected to have an impact on existing recreational uses.

## **3.10. Cultural and Historical Resources**

### **3.10.1. Proposed Action**

The project falls within the Southeastern New Mexico Archaeological Region. This region contains the following cultural/temporal periods: Paleoindian (ca. 12,000 – 6,200 B.C.), Archaic (ca. 6,200 B.C. – A.D. 500), Ceramic (ca. A.D. 500 – 1540), Protohistoric and Spanish Colonial (ca. A.D. 1400 – 1821), and Mexican and American Historical (ca. A.D. 1822 to early 20<sup>th</sup> century). Sites representing any or all of these periods are known to occur within the region. A more complete discussion can be found in *Living on the Land: 11,000 Years of Human Adaptation in Southeastern New Mexico; An Overview of Cultural Resources in the Roswell District, Bureau of Land Management* published in 1989 by the U.S. Department of Interior, Bureau of Land Management.

### **Native American Religious Concerns**

The BLM conducts Native American consultation regarding Traditional Cultural Places (TCP) and Sacred Sites during land-use planning and its associated environmental impact review. However, to date no TCPs or sacred sites have been identified in the vicinity of the current project area.

### **Direct and Indirect Effects**

Cultural resources on public lands, including archaeological sites and historic properties, are protected by federal law and regulations (Section 106 of the National Historic Preservation Act and the National Environmental Policy Act). The proposed project is defined as an undertaking under 36 CFR 800.16(y); however, in accordance with BLM Manual 8111 Section 1-1, the proposed project may be waived from Class III inventory under criterion (6) "The nature of the proposed action is such that no impact can be expected on significant cultural resources." No impact can be expected with motorized vehicles remaining on previously constructed roads and foot traffic traveling from the parking location to the river.

### **3.11. Cumulative Effects**

Cumulative impacts are the combined effect of past projects, specific planned projects, and other reasonably foreseeable future actions within the project study area. The combination of all land use practices across a landscape has the potential to change the visual character, disrupt natural water flow and infiltration, disturb cultural sites, cause minor increases in greenhouse gas emissions, fragment wildlife habitat and contaminate groundwater. However, the likelihood of these impacts occurring is minimized through standard mitigation measures, special Conditions of Approval and ongoing monitoring studies.

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## **CHAPTER 4. SUPPORTING INFORMATION**

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### **4.1. List of Preparers**

Prepared by: Tim Frey, Fish Biologist, Bureau of Land Management - Carlsbad Field Office

Date: 11/30/2012

The following individuals aided in the preparation of this document:

BLM Soils, Vegetation, Range, Water Quality/Quantity – Steve Daly, Soil Conservationist  
BLM Wildlife Biology & Riparian – John A. Chopp-Wildlife Biologist  
BLM GIS Specialist- Stephen Cannon  
BLM Hydrology- Michael McGee-Hydrologist  
BLM Cultural Resources-James Smith



## 4.2. References

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